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10/699,688	11/04/2003	Henning Bulow	Q78112	4945

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EXAMINER	
LI, SHI K	

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/699,688	BULOW, HENNING	
	Examiner	Art Unit	
	Shi K. Li	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 10 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 10 recites a computer readable medium storing a program for performing a method. The method comprises steps including "splitting the optical signal into parts and providing the signal parts to a respective branch of at least two branches". However, instant specification does not teach how a program stored in readable medium, when executed by a computer, can split an optical signal into parts. The method further comprises limitation "filtering at least one split optical signal". However, instant specification does not teach how a program stored in readable medium, when executed by a computer, can filter an optical signal. To the understanding of the Examiner, the splitting of optical signal, as taught by instant specification, is done by a splitting unit instead of a computer program.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3, 11 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Van den Bergh et al. (European Patent Application EP 0,996,243 A1).

Van den Bergh et al. discloses in FIG. 2 a DSP receiver comprising splitter 6, λ-dependent attenuator 7, photodiodes 8, A/D converters 11 and digital signal processor (DSP) 12.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawarai (U.S. Patent 6,707,963) in view of Jung et al. (U.S. Patent 7,068,949 B2) and Wan et al. (U.S. Patent 7,158,723 B2).

Regarding claim 1, Kawarai discloses in FIG. 6 a wavelength locker comprising splitter for splitting light signal into a plurality of branches, filters 36 and 38, photodiodes 40 and 42, and calculation unit. The difference between Kawarai and the claimed invention is that Kawarai does not teach using digital signal process in the calculation unit. Jung et al. teaches in FIG. 1 the use of A/D converter and microprocessor for digital signal processing data. Wan et al. further teaches in FIG. 4 that a plurality of A/D converters, one for each signal path. One of ordinary skill in the art would have been motivated to combine the teaching of Jung et al. and Wan et al. with the wavelength locker of Kawarai because digital signal processing provides high accuracy and flexibility. Thus it would have been obvious to one of ordinary skill in the art

at the time the invention was made to use digital signal processing, as taught by Jung et al. and Wan et al., in the wavelength locker of Kawarai because digital signal processing provides high accuracy and flexibility.

Regarding claims 2-3 and 12-13, Kawarai teaches in col. 4, lines 20-23 different filters for 36 and 38. They are spectral filter.

Regarding claim 14, Kawarai teaches a WDM network. It is well known in the art that a WDM network can have over 100 channels each of which can carry 10 Gb/s or more. That is, Kawarai suggests or renders obvious that the modified wavelength locker is provided in a terabit optical network. The Examiner also notes that the additional limitation only constitutes a statement of intended use and does not carry patentability weight.

7. Claims 1, 3, 5, 11 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Chung et al. (U.S. Patent 7,177,541 B2) in view of Van De Bergh et al. (U.S. Patent 6,714,741 B1).

Regarding claim 1, Chung et al. teaches in FIG. 2 an OSNR monitor comprising coupler 10, optical filter 20, photodiodes 30, A/D converter 50 and computer 60 for processing output from the A/D converter. The difference between Chung et al. and the claimed invention is that Chung et al. shows only one A/D converter unit. However, it is understood that each of the outputs from the photodiodes is converted from analog format to digital format separately. In case that the Applicant does not agree, the Examiner cites Van De Bergh et al. for teaching separate A/D converter for each photodiode. Whether to draw the A/D converter as one module or two modules is a personal taste. One of ordinary skill in the art would have been motivated to combine the teaching of Van De Bergh et al. with the OSNR monitor of Chung et al. because

drawing separate A/D converter associating with each photodiode clearly indicates that each signal is being converted into digital signal. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to draw separate A/D converter for each photodiode output, as taught by Van De Bergh et al., in the OSNR monitor of Chung et al. because drawing separate A/D converter associating with each photodiode clearly indicates that each signal is being converted into digital signal.

Regarding claim 3, Chung et al. teaches a spectral filter.

Regarding claim 5, Chung et al. teaches in FIG. 5 polarization controller 80.

Regarding claim 11, Chung et al. teaches that the first branch does not have optical filter and represent the whole optical signal.

Regarding claim 14, Chung et al. teaches a WDM network. It is well known in the art that a WDM network can have over 100 channels each of which can carry 10 Gb/s or more. That is, Kawarai suggests or renders obvious that the modified wavelength locker is provided in a terabit optical network. The Examiner also notes that the additional limitation only constitutes a statement of intended use and does not carry patentability weight.

8. Claims 1-3, 5-8, 10, 12-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lima et al. (A. Lima, et al., "Polarization Diversity and Equalization for PMD Mitigation in Optical Communication Systems", IEEE International Conference on Acoustics, Speech, and Signal Processing, May 13-17, 2002) in view of Agazzi et al. (U.S. Patent Application Pub. 2002/0012152 A1).

Regarding claims 1 and 6-7, Lima et al. discloses in FIG. 1 a polarization diversity receiver comprising an input, a splitter, a plurality of different polarization beam splitter and a

plurality of photodiodes. The difference between Lima et al. and the claimed invention is that Lima et al. does not teach that the signal processing units COMB/EQ and Decision module are A/D converters and DSP. However, Lima et al. teaches on page 2723 that a lot of calculation is needed to process the signal. Agazzi et al. teaches in FIG. 1A to use ADC and DSP for processing optical data signals. One of ordinary skill in the art would have been motivated to combine the teaching of Agazzi et al. with the polarization diversity receiver of Lima et al. because digital signal process provide fast and accurate result and suitable for signal processing that requires a lot of calculation. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use digital signal processing, as taught by Agazzi et al., in the polarization diversity receiver of Lima et al. because digital signal process provide fast and accurate result and suitable for signal processing that requires a lot of calculation.

Regarding claims 2-3 and 12-13, Lima et al. teaches in FIG. 1 different polarization beam splitters.

Regarding claim 5, Lima et al. teaches in FIG. 3 an additional optical filter in front of the diversity receiver.

Regarding claims 8, 15 and 20, Lima et al. teaches on page 2723, left col. likelihood of mark (bit 1) and space (bit 0).

Regarding claim 10, Lima et al. teaches on page 2723, right col. simulation. It is inherently or obvious to use a computer with computer program for the simulation.

Regarding claim 14, Lima et al. teaches in FIG. 3 that a channel carries 10 Gbit/s. It is well known in the art that a WDM system can have over 100 channels. Together, this gives

terabit capacity. The Examiner also notes that the additional limitation only constitutes a statement of intended use and does not carry patentability weight.

Regarding claims 16-17, Lima et al. teaches in FIG. 1 different polarization beam splitters.

Regarding claim 19, Lima et al. teaches in FIG. 3 an additional optical filter in front of the diversity receiver.

9. Claims 4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lima et al. and Agazzi et al. as applied to claims 1-3, 5-8, 10, 12-17 and 19-20 above, and further in view of Al-Araji et al. (U.S. Patent 6,559,756 B2).

Lima et al. and Agazzi et al. have been discussed above in regard to claims 1-3, 5-8, 10, 12-17 and 19-20. The difference between Lima et al. and Agazzi et al. and the claimed invention is that Lima et al. and Agazzi et al. do not teach field program gate array (FPGA). Al-Araji et al. teaches in col. 6, lines 37-40 that DSP circuit could be implemented with FPGA. Where the claimed differences involve the substitution of interchangeable or replaceable equivalents and the reason for the selection of one equivalent for another was not to solve an existent problem, such substitution has been judicially determined to have been obvious. See In re Ruff, 118, USPQ 343 (CCPA 1958). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use FPGA as DSP circuit.

10. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lima et al. and Agazzi et al. as applied to claims 1-3, 5-8, 10, 12-17 and 19-20 above, and further in view of Chouly et al. (U.S. Patent Application Pub. 2004/0017857 A1).

Lima et al. and Agazzi et al. have been discussed above in regard to claims 1-3, 5-8, 10, 12-17 and 19-20. The difference between Lima et al. and Agazzi et al. and the claimed invention is that Lima et al. and Agazzi et al. do not teach a MAP algorithm. Chouly et al. teaches a MAP algorithm (see paragraph [0106]). One of ordinary skill in the art would have been motivated to combine the teaching of Chouly et al. with the modified polarization diversity receiver of Lima et al. and Agazzi et al. because MAP algorithm minimizes errors. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use MAP algorithm, as taught by Chouly et al., in the modified polarization diversity receiver of Lima et al. and Agazzi et al. because MAP algorithm minimizes errors.

Response to Arguments

11. Applicant's arguments with respect to claims 120 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (7:30 a.m. - 4:30 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

skl
8 May 2007

Shi K. Li
Primary Patent Examiner